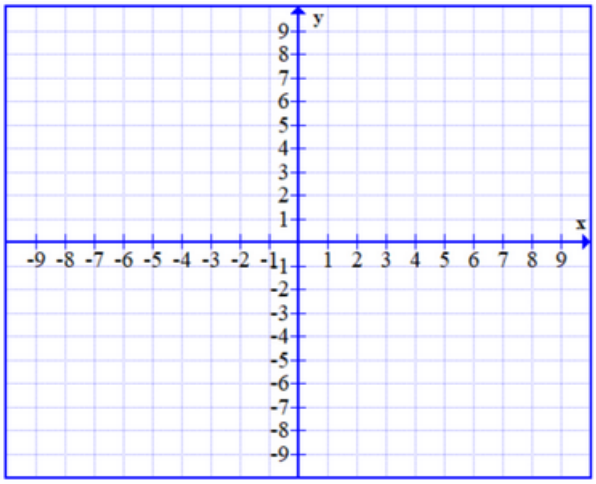
Algebra 2 - Rationals Problem Set

Stasya

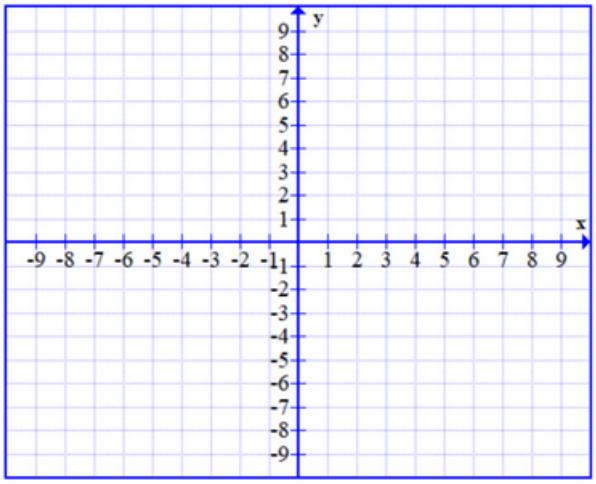
1. Factor $4x^2 + 8x + 4$.

2. Factor $x^2 - 36$.

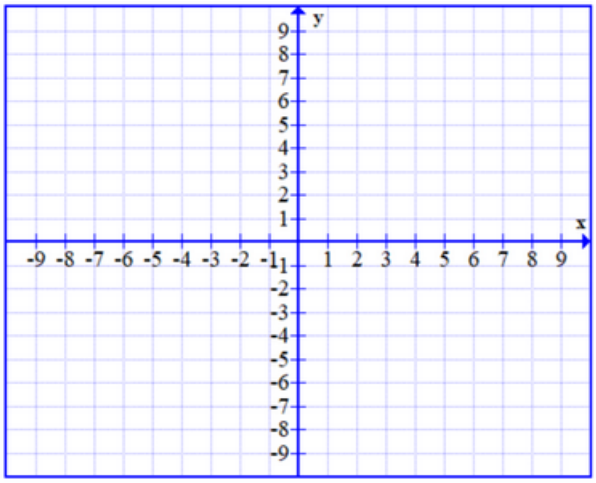
3. Graph the function $f(x) = \frac{1}{x-1} + 5$. Write the transformations, the vertical asymptote, the horizontal asymptote, the domain, and range of the function.



4. Graph the function $f(x) = \frac{3x^2+x-4}{2x^2-5x}$.



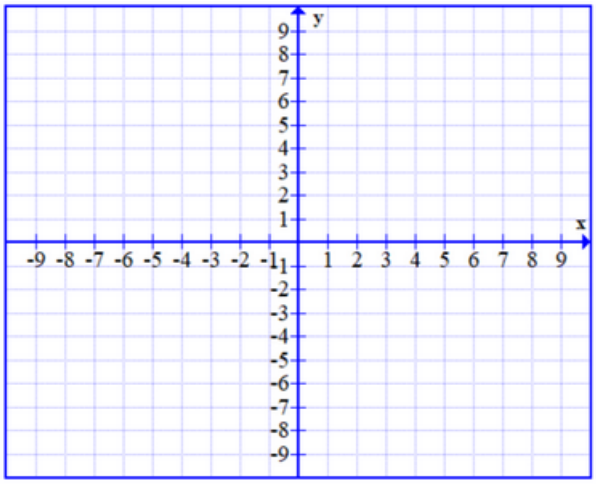
5. Graph the function $f(x) = \frac{x(x^2+2x+1)}{(x+4)(x^2-16)}$.



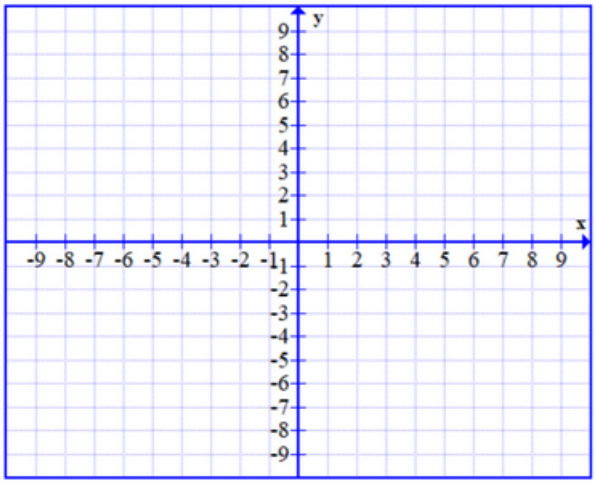
6. Identify the transformations used to get from $f(x) = \frac{1}{x-3} - 2$ to $g(x) = \frac{-2}{x+1} + 3$.

7. Create a rational function that has roots at $(-4, 0)$ and $(4, 0)$, a horizontal asymptote at $y = 3$, vertical asymptotes at $x = 3$ and $x = 0$, and a hole at $x = -1$.

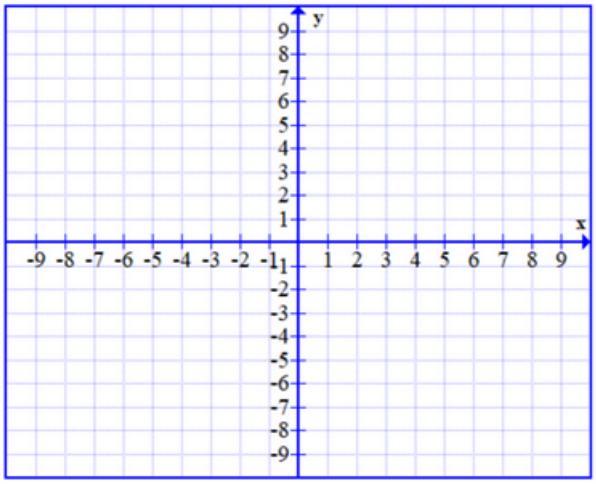
8. Graph the function $f(x) = \frac{x^2-4}{x}$.



9. Graph the function $f(x) = \frac{x^3 - x}{x^2 + x - 2}$.



10. Using the identified features in the graph, create the equation of the rational function shown.



11. Simplify $\frac{2b+10}{6b} \cdot \frac{3b-15}{b^2-25}$.

12. Simplify $\frac{n^2+5n+6}{n^2-2n-15} \div \frac{5n^2+9n-2}{3n^2-11n-20}$.

13. Simplify $\frac{3}{x^2-16} - \frac{1}{x-4} + \frac{3}{x+4}$.

14. Simplify $\frac{2x^2-16}{x^2-4} - \frac{x+4}{x+2}$.

15. Simplify $\frac{\frac{3}{x}+\frac{x}{2}}{\frac{x-1}{x}}$. Write all undefined values.

16. Simplify $\frac{\frac{1}{3x^2-3}}{\frac{5}{x+1}-\frac{x+4}{x^2-3x-4}}$. Write all undefined values.

17. Tim can stuff envelopes three times as fast as his wife Jenn. They have to stuff 5000 envelopes for a fundraiser. Working together, Tim and Jenn can complete the job in four hours. How long would it take each of them if they were working alone?

18. A paddle boat is moving in a river that has a current (speed) of 4 mph. The boat is paddled 12 miles downstream in a river in the same time it takes to go 6 miles upstream. What is the speed of the boat in still water?